

AMENDMENT NO. 1 FEBRUARY 2016
TO
IS 1319 : 1983 SPECIFICATION FOR EDIBLE
TAPIOCA STARCH

(Second Revision)

(Page 5, clause 3.3) — Insert the following new clause and renumber the subsequent clauses accordingly:

‘3.4 The hydrocyanic acid content in the product shall not exceed 5 ppm when determined as per the method given in Annex A.

(Page 8, clause 7.2) — Insert the following new Annex at the end:

ANNEX A
(Clause 3.4)

DETERMINATION OF HYDROCYANIC ACID

A-0 PRINCIPLE

The glucosides are hydrolyzed and the liberated hydrocyanic acid steam distilled and titrated with silver nitrate in an ammoniacal medium in the presence of potassium iodide, the hydrocyanic acid forming the soluble complex $\text{Ag}(\text{CN})_2$. The end point of the titration is characterized by the appearance of permanent turbidity due to precipitation of silver iodide.

Autolysis of bound glucosides shall not take place in sago, since the enzyme linamarase associated with hydrolysis of the glucoside, linamarin, is completely lost during processing. Hence, extraneous addition of linamarase is needed to release free hydrocyanic acid (HCN) from any bound glucoside.

A-1 APPARATUS

A-1.1 Mechanical Grinding Mill

A-1.2 Sieve, with 1 mm aperture.

Amendment No. 1 to IS 1319 : 1983

A-1.4 Volumetric Flask, 250 ml capacity.

A-1.5 Pipette, 100 ml capacity.

A-1.6 Steam Distillation Apparatus

A-2 REAGENTS

A-2.1 Sodium Hydroxide Solution, 2.5 percent.

A-2.2 Ammonia Solution, approximately 6 M prepared by diluting concentrated ammonia solution (0.9 g/ml) with an equal volume of water.

A-2.3 Potassium Iodide Solution, 5 percent.

A-2.4 Silver Nitrate Standard Solution, 0.02 M.

A-2.5 Linamarase Solution

- a) *Isolation of linamarase from cassava leaf/rind* — Cut cassava leaf/rind into small pieces and homogenize with chilled acetone using a homogenizer. Filter the slurry through Whatman No. 1 filter paper using a Buchner funnel and wash the residue with acetone till colourless. Air dry the acetone powder collected on the filter paper and store at -20°C.

Stir acetone powder (10 g) obtained from leaf/rind with phosphate buffer (0.1 M, pH 6.0) for 30 min. Centrifuge the solution at 10 000 g and collect the clear supernatant. Add 3 volumes of chilled acetone and keep the solution at 4°C overnight. Collect the protein precipitate by centrifugation at 10 000 g for 15 min. Dissolve the precipitate in 10 ml phosphate buffer (0.1 M, pH 6.0), dialyze against tenfold diluted phosphate buffer (0.01 M) and use for hydrolysis.

- b) *Isolation of linamarase from cassava latex* — Latex is collected from the cut ends of cassava petioles. 2 g latex is stirred with 50 ml phosphate buffer for 30 min and the solution centrifuged at 10 000 g for 30 min. Further process is similar as given in **A-2.5 (a)**.

A-3 PROCEDURE

Grind a small quantity of the sample and reject it. Then grind adequate quantity of the remaining sample to pass through 1 mm sieve. Weigh 20 g of ground sample, transfer to 1 litre distillation flask or 800 ml Kjeldahl flask, add 200 ml water and add 1.0 ml linamarase to the system. Immediately connect the flask to the distillation apparatus. Let the system stand for 2 h. Autolysis should be conducted with apparatus completely connected for distillation. Steam distill and

collect 150 - 160 ml distillate in NaOH solution (0.5 g in 20 ml water) and dilute to definite volume that is 250 ml. Take 100 ml from this, add 8 ml of 6 M NH_4OH and 2 ml of potassium iodide solution and titrate with 0.02 M AgNO_3 until permanent turbidity appears. For easy recognition of the end point of titration, it is recommended that a black back ground be used.

A-4 CALCULATION

1 ml 0.02 M silver nitrate = 1.08 mg of HCN